What is claimed is

1. A WDM (Wavelength Division Multiplexed) transmission system, comprising:

a plurality of WDM optical networks, each of said WDM optical network including

an optical signal receiver, and

an optical signal transmitter, communicably connected to said optical signal receiver, for transmitting, to said optical signal receiver, a WDM signal having a plurality of optical signals at respective different wavelengths with adjusting each of intensities of said plural optical signals by performing preemphasis; and

a central controller, communicably connected to said plural WDM optical networks via a plurality of monitor/control lines respectively, including:

variation factor monitoring means for monitoring one or more variation factors which requires a new setting for said preemphasis performed by said optical signal transmitter of each said WDM optical network via a respective one of the plural monitor/control lines; and

preemphasis controlling means for controlling controlling a status of said

preemphasis by adjusting said setting for said preemphasis performed by said optical signal transmitter of each said WDM optical network via the respective monitor/control line based on the result of the monitoring carried out by said variation factor monitoring means.

2. A WDM transmission system according to claim 1, wherein:

said central controller further includes storing means for storing intensity information of intensities of the optical signals at the respective different wavelengths, which optical signals are included in the WDM signal output from said optical signal transmitter of each said WDM optical network when an initialization for amounts of said preemphasis is performed, and time information of the time when said initialization is performed;

said variation factor monitoring means includes elapsed-time monitoring means for monitoring, as one of said variation factors, whether or not a predetermined time period has passed since an initialization of a first optical signal transmitter, which is the optical signal transmitter of one of said plural WDM optical networks based on said time information stored in said storing means; and

said preemphasis controlling means includes intensity controlling means for controlling, if the result of said monitoring by said elapsed-time monitoring means is positive, intensities of optical signals in a WDM signal that is to be output from said first optical signal transmitter by adjusting amounts of said preemphasis performed by said first optical signal transmitter in such a manner that said last-named intensites of said first optical signal transmitter become identical with those when said initialization is performed, based on said intensity information stored in said storing means.

3. A WDM transmission system according to claim 2, wherein

said variation factor monitoring means of said central controller further includes:

the-number-of-wavelengths-information collecting means for collecting, as one of said variation factors, the-number-of-wavelengths information about the number of wavelengths used for optical signals of the WDM signal transmitted in said each WDM optical network, and

the-number-of-wavelengths monitoring means for monitoring whether or not there is a change in the number of wavelengths used

for optical signals of the WDM signal transmitted in a first WDM optical network, which is the WDM optical network one of said plural WDM optical networks, based on said the-number-of-wavelengths information, which has been collected by said the-number-of-wavelengths collecting means; and

said preemphasis controlling means of said central controller includes:

amount-of-preemphasis computing means for computing, if the result of said last-named monitoring by said the-number-of-wavelengths monitoring means is positive, amounts of preemphasis that is to be performed on the plurality optical signals of the WDM signal in said first optical network in accordance with the change in the number of wavelengths, which change is monitored as said the-number-of- wavelengths information by said wavelength monitoring means, and

amount-of-preemphasis controlling means for controlling an optical signal transmitter said first WDM optical network in such a manner that said first particular WDM optical network performs preemphasis of the last-named

amounts, which has been computed by said amount-of-preemphasis computing means.

4. A WDM transmission system according to claim 3, wherein

said variation factor monitoring means of said central controller includes:

signal-quality-information collecting means for collecting, as one of said variation factors, signal quality information about a quality of WDM signal, which is transmitted in said each WDM optical network, at the time when being received by said individual optical receiver therein,

threshold-value-information retaining means for retaining threshold value information of threshold values of qualities of said WDM signal transmitted in said each WDM optical networks, and

signal-quality monitoring means for monitoring whether or not said signal quality information for a second WDM optical network, which is the WDM optical network one of said plural WDM optical networks, is equal to or smaller than said threshold value for said particular WDM optical network, which information is retained in said

threshold-value-information retaining means; and

said preemphasis controlling means of said central controller includes quality controlling means for controlling, if the result of last-named monitoring by said signal-quality monitoring means is positive, the intensities of optical signals in a WDM signal that is to be transmitted in said second WDM optical network by adjusting amounts of preemphasis that is to be performed on said second WDM optical network in such a manner that signal quality information of the last-named WDM signal transmitted in said second WDM optical network becomes greater than said last-named threshold value.

5. A WDM transmission system according to claim 4, wherein said signal-quality-information collecting means periodically collects said signal quality information.

6. A WDM transmission system according to claim 4, wherein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information

of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted in each said optical network, which issued said received alarm information.

7. A WDM transmission system according to claim 5, wherein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted in each said optical network, which issued said received alarm information.

8. A WDM transmission system according to claim 2, wherein

said variation factor monitoring means of said

central controller includes:

signal-quality-information collecting means for collecting, as one of said variation factors, signal quality information about a quality of WDM signal, which is transmitted in said each WDM optical network, at the time when being received by said individual optical receiver therein,

threshold-value-information retaining means for retaining threshold value information of threshold values of qualities of said WDM signal transmitted in said each WDM optical networks, and

signal-quality monitoring means for monitoring whether or not said signal quality information for a second WDM optical network, which is the WDM optical network one of said plural WDM optical networks, is equal to or smaller than said threshold value for said particular WDM optical network, which information is retained in said threshold-value-information retaining means; and

said preemphasis controlling means of said central controller includes quality controlling means for controlling, if the result of last-named monitoring by said signal-quality monitoring means

is positive, the intensities of optical signals in a WDM signal that is to be transmitted in said second WDM optical network by adjusting amounts of preemphasis that is to be performed on said second WDM optical network in such a manner that signal quality information of the last-named WDM signal transmitted in said second WDM optical network becomes greater than said last-named threshold value.

9. A WDM transmission system according to claim 8, wherein said signal-quality-information collecting means periodically collects said signal quality information.

10. A WDM transmission system according to claim 8, whrerein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted

in each said optical network, which issued said received alarm information.

11. A WDM transmission system according to claim 9, whrerein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted in each said optical network, which issued said received alarm information.

12. A WDM transmission system according to claim 1, whrerein

said variation factor monitoring means of said central controller further includes:

the-number-of-wavelengths-information collecting means for collecting, as one of said variation factors, the-number-of-wavelengths information about the number of wavelengths used for optical

signals of the WDM signal transmitted in said each WDM optical network, and

the-number-of-wavelengths monitoring means for monitoring whether or not there is a change in the number of wavelengths used for optical signals of the WDM signal transmitted in a first WDM optical network, which is the WDM optical network one of said plural WDM optical networks, based on said the-number-of-wavelengths information, which has been collected by said the-number-of-wavelengths collecting means; and

said preemphasis controlling means of said central controller includes:

amount-of-preemphasis computing means for computing, if the result of said last-named monitoring by said the-number-of-wavelengths monitoring means is positive, amounts of preemphasis that is to be performed on the plurality optical signals of the WDM signal in said first optical network in accordance with the change in the number of wavelengths, which change is monitored as said the-number-of- wavelengths information by said wavelength monitoring means, and

amount-of-preemphasis controlling means for controlling an optical signal transmitter said first WDM optical network in such a manner that said first particular WDM optical network performs preemphasis of the last-named amounts, which has been computed by said amount-of-preemphasis computing means.

13. A WDM transmission system according to claim 12, whrerein

said variation factor monitoring means of said central controller includes:

signal-quality-information collecting means for collecting, as one of said variation factors, signal quality information about a quality of WDM signal, which is transmitted in said each WDM optical network, at the time when being received by said individual optical receiver therein,

threshold-value-information retaining means for retaining threshold value information of threshold values of qualities of said WDM signal transmitted in said each WDM optical networks, and

signal-quality monitoring means for monitoring whether or not said signal quality

information for a second WDM optical network, which is the WDM optical network one of said plural WDM optical networks, is equal to or smaller than said threshold value for said particular WDM optical network, which information is retained in said threshold-value-information retaining means; and

said preemphasis controlling means of said central controller includes quality controlling means for controlling, if the result of last-named monitoring by said signal-quality monitoring means is positive, the intensities of optical signals in a WDM signal that is to be transmitted in said second WDM optical network by adjusting amounts of preemphasis that is to be performed on said second WDM optical network in such a manner that signal quality information of the last-named WDM signal transmitted in said second WDM optical network becomes greater than said last-named threshold value.

14. A WDM transmission system according to claim 13, wherein said signal-quality-information collecting means periodically collects said signal quality information.

15. A WDM transmission system according to claim 13, whrerein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted in each said optical network, which issued said received alarm information.

16. A WDM transmission system according to claim 14, whrerein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted

in each said optical network, which issued said received alarm information.

17. A WDM transmission system according to claim 1, whrerein

said variation factor monitoring means of said central controller includes:

signal-quality-information collecting means for collecting, as one of said variation factors, signal quality information about a quality of WDM signal, which is transmitted in said each WDM optical network, at the time when being received by said individual optical receiver therein,

threshold-value-information retaining means for retaining threshold value information of threshold values of qualities of said WDM signal transmitted in said each WDM optical networks, and

signal-quality monitoring means for monitoring whether or not said signal quality information for a second WDM optical network, which is the WDM optical network one of said plural WDM optical networks, is equal to or smaller than said threshold value for said particular WDM optical network, which information is retained in said

threshold-value-information retaining means; and

said preemphasis controlling means of said central controller includes quality controlling means for controlling, if the result of last-named monitoring by said signal-quality monitoring means is positive, the intensities of optical signals in a WDM signal that is to be transmitted in said second WDM optical network by adjusting amounts of preemphasis that is to be performed on said second WDM optical network in such a manner that signal quality information of the last-named WDM signal transmitted in said second WDM optical network becomes greater than said last-named threshold value.

18. A WDM transmission system according to claim 17, whrerein said signal-quality-information collecting means periodically collects said signal quality information.

19. A WDM transmission system according to claim 17, whrerein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information

of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted in each said optical network, which issued said received alarm information.

20. A WDM transmission system according to claim 18, wherein

said variation factor monitoring means of said central controller further includes alarm-information receiving means for receiving, as one of said variation factors, alarm information of an alarm issued over the WDM signal transmitted in each said WDM optical network; and

said signal-quality-information collecting means starts, upon receipt of said alarm by said alarm receiving means, the collecting of said signal quality information of the WDM signal transmitted in each said optical network, which issued said received alarm information.

21. A central controller, which is communicably connected, via a plurality of monitor/control lines respectively, to each of a

plurality of WDM (Wavelength Division Multiplexed) optical networks, each of the WDM optical network including an optical signal receiver and an optical signal transmitter, communicably connected to the optical signal receiver, for transmitting, to the optical signal receiver, a WDM signal having a plurality of optical signals at respective different wavelengths with adjusting each of intensities of the plural optical signals by performing preemphasis, said controller comprising:

variation factor monitoring means for monitoring one or more variation factors which requires a new setting for said preemphasis performed by the optical signal transmitter of each of the WDM optical networks; and

preemphasis controlling means for controlling controlling a status of said preemphasis by adjusting said setting for said preemphasis performed by the optical signal transmitter of each of the WDM optical networks via respective one of the plural monitor/control lines based on the result of the monitoring carried out by said variation factor monitoring means.

22. A method for controlling preemphases in a WDM (Wavelength Division Multiplexed) transmission system comprising a plurality of WDM

optical networks, each of the WDM optical networks including an optical signal receiver and an optical signal transmitter, communicably connected to the optical signal receiver, for transmitting, to the optical signal receiver, a WDM signal having a plurality of optical signals at respective different wavelengths, with adjusting each of intensities of the plural optical signals by performing preemphasis , and a central controller communicably connected to each of the plural WDM optical networks via a plurality of monitor/control lines respectively, said method comprising the steps of:

at the central controller

(a) monitoring one or more variation factors which requires a new setting for said preemphasis performed by the optical signal transmitter of each of the WDM optical networks; and

(b)controlling controlling a status of said preemphasis by adjusting the setting for said preemphasis performed by the optical signal transmitter of each of the WDM optical networks via a respective one of the plural monitor/control lines based on the result of the monitoring in said variation factor monitoring step (a).

23. A method for controlling preemphasis according to claim 22, further comprising the steps

of:

at a storing means

storing intensity information of intensities of the optical signals at the respective different wavelengths are included in the WDM signal output from the optical signal transmitter of each of the plural WDM signal networks when an initialization for amounts of said preemphasis is performed, and time information of the time when the intialization is performed,

said variation factors monitoring step (a) including the step of(a-1) monitoring whether or not a predetermined time period has passed since an initialization of a first optical signal transmitter, which is the optical signal transmitter of one of the plural WDM optical networks based on the time information stored in said storing step,

said optical transmitters controlling step (b) including the step of (b-1) controlling, if the result of said monitoring by said monitoring step (a-1) is positive, intensities of optical signals in a WDM signal that is to be output from a first optical signal transmitter by adjusting amounts of said preemphasis performed by the first optical signal transmitter in such a manner that the last-named intensities of the optical signals of the first optical signal transmitter become

identical with those when the initialization is performed, based on the intensity information stored in said storing step.

24. A method for controlling preemphasis according to claim 23,

said variation factors monitoring steps (a) further including the step of (a-2) monitoring, as one of the variation factors, whether or not there is a change in the number of wavelengths used for optical signals in the individual WDM signal transmitted in a first paritcular WDM optical network, which is the WDM optical network of one of the plural WDM networks, by collecting information about the number of optical signals in the WDM signal transmitted in the first WDM optical network; and

said optical transmitters controlling step (b) including the steps of:

(b-2) computing, if the result of said last-named monitoring step is positive, amounts of preemphasis that is to be performed on a plurality of optical signals of a WDM signal in the first optical network in accordance with the change in the number of optical signals, which is monitored in said last-named monitoring step (a-2), and

(b-3) controlling a optical transmitter of the first WDM optical network in such a manner that the first particular network performs preemphasis of the last-named amounts, which has been computed in said amout-of-preemphasis computing step (b-2).

25. A method for controlling preemphasis according to claim 23, further comprising the step of collecting, as one of the variation factors, signal quality information about quality of the WDM signal transmitted in each of the WDM optical networks,

said variation factors monitoring step (a) further including the step of (a-3) monitoring whether or not the signal quality information of a second WDM optical network, which is the WDM optical network one of the plural WDM optical networks, are equal to or smaller than threshold value previously set for the second WDM network; and

said optical transmitter controlling step (b) further including the step of (b-4) controlling, if the result of monitoring in said last-named monitoring step (a-3) is positive, the intensities of optical signals in a WDM signal that is to be transmitted in the second optical transmitter in the second particular WDM network by adjusting

amounts of preemphasis that is to be performed on the second WDM optical network in such a manner that said signal quality of the last-named WDM signal transmitted in the second WDM optical network becomes greater than the last-named threshold value for the second optical network.

26. A method for controlling preemphasis accprding to claim 24, further comprising the step of collecting, as one of the variation factors, signal quality information about quality of the WDM signal transmitted in each of the WDM optical networks,

said variation factors monitoring step (a) further including the step of (a-3) monitoring whether or not the signal quality information of a second WDM optical network, which is the WDM optical network one of the plural WDM optical networks, are equal to or smaller than threshold value previously set for the second WDM network; and

said optical transmitter controlling step (b) further including the step of (b-4) controlling, if the result of monitoring in said last-named monitoring step (a-3) is positive, the intensities of optical signals in a WDM signal that is to be transmitted in the second optical transmitter in the second particular WDM network by adjusting

amounts of preemphasis that is to be performed on the second WDM optical network in such a manner that said signal quality of the last-named WDM signal transmitted in the second WDM optical network becomes greater than the last-named threshold value for the second optical network.

27. A method for controlling preemphasis accprding to claim 22, further comprising the steps of:

said variation factors monitoring steps (a) further including the step of (a-2) monitoring, as one of the variation factors, whether or not there is a change in the number of wavelengths used for optical signals in the individual WDM signal transmitted in a first paritcular WDM optical network, which is the WDM optical network of one of the plural WDM networks, by collecting information about the number of optical signals in the WDM signal transmitted in the first WDM optical network; and

said optical transmitters controlling step (b) including the steps of :

(b-2) computing, if the result of said last-named monitoring step is positive, amounts of preemphasis that is to be performed on a plurality of optical signals of a WDM

signal in the first optical network in accordance with the change in the number of optical signals, which is monitored in said last-named monitoring step (a-2), and

(b-3) controlling a optical transmitter of the first WDM optical network in such a manner that the first particular network performs preemphasis of the last-named amounts, which has been computed in said amout-of-preemphasis computing step (b-2).

28. A method for controlling preemphasis accprding to claim 27, further comprising the step of collecting, as one of the variation factors, signal quality information about quality of the WDM signal transmitted in each of the WDM optical networks,

said variation factors monitoring step (a) further including the step of (a-3) monitoring whether or not the signal quality information of a second WDM optical network, which is the WDM optical network one of the plural WDM optical networks, are equal to or smaller than threshold value previously set for the second WDM network; and

said optical transmitter controlling step (b) further including the step of (b-4)

controlling, if the result of monitoring in said last-named monitoring step (a-3) is positive, the intensities of optical signals in a WDM signal that is to be transmitted in the second optical transmitter in the second particular WDM network by adjusting amounts of preemphasis that is to be performed on the second WDM optical network in such a manner that said signal quality of the last-named WDM signal transmitted in the second WDM optical network becomes greater than the last-named threshold value for the second optical network.

29. A method for controlling preemphasis accprding to claim 22, further comprising the step of collecting, as one of the variation factors, signal quality information about quality of the WDM signal transmitted in each of the WDM optical networks,

said variation factors monitoring step (a) including the step of (a-3) monitoring whether or not the signal quality information of a second WDM optical network, which is the WDM optical network one of the plural WDM optical networks, are equal to or smaller than threshold value previously set for the second WDM network; and

said optical transmitter controlling step (b) including the step of (b-4) controlling, if the result of monitoring in said last-named monitoring step (a-3) is positive, the intensities of optical signals in a WDM signal that is to be transmitted in the second optical transmitter in the second particular WDM network by adjusting amounts of preemphasis that is to be performed on the second WDM optical network in such a manner that said signal quality of the last-named WDM signal transmitted in the second WDM optical network becomes greater than the last-named threshold value for the second optical network.

30. A method for controlling preemphasis according to claim 22,

said variation factors monitoring step (a) including the step of

(a-4) receiving, as one of said variation factors, alarm information about an alarm issued over the WDM signal transmitted in each of the plural WDM optical networks; and

(a-5)collecting, upon receipt said alarm information in said alarm receiving step (a-4), said signal

quality information of the last-named WDM signal.